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Q1 Name of your organization.

National Audubon Society/Audubon California

Q2 Grant #

20170380

Q3 Grant Period

August 30, 2017 – August 29, 2018

Q4 Location of your organization

City	Trabuco Canyon
State	CA

Q5 Name and Title of person completing evaluation.

Sandy DeSimone, Director of Research and Education

Q6 Phone Number:

9498580309

Q7 Email address.

sdesimone@audubon.org

Page 2: Key Outcomes and Results

Q8 Total number of clients served through this grant funding:

2000

Q9 Describe the project's key outcomes and results based on the goals and objectives. Use the following format: State the Goal: State Objective 1: Describe the Activities, Results and Outcomes for Objective 1: State Objective 2 (if applicable): Describe the Activities, Results and Outcomes for Objective 2: State Objective 3 (if applicable): Describe the Activities, Results and Outcomes for Objective 3:

The generous support provided by the S. L. Gimbel Fund has made a significant positive impact on Audubon Starr Ranch Sanctuary. Your investment has helped us make the property more resilient to drought and associated wildfire, and get ahead of the emerging ecological threat of tree pests and diseases. We completed all anticipated activities during the year towards our long-term goals. Much more needs to be done in terms of monitoring, applied research, and habitat restoration, but we hope you share our pride in the progress we've made together.

PROJECT GOAL: Conserve Audubon Starr Ranch Sanctuary's 660 acres of native oak and riparian woodlands in Orange County, California, which are threatened by tree pests and diseases that are spreading in response to climatic changes, especially drought.

PROJECT OBJECTIVE: Assess conditions of 60 acres of coast live oak woodlands and 232 acres of riparian woodlands, monitor for presence of tree pests and diseases, and advance oak woodland restoration.

ANTICIPATED OUTCOMES: We anticipated being able to complete assessments of 60 new acres of oak woodlands and 232 acres of riparian woodlands, with correlated wildlife surveys for the 60 upland acres. We also anticipated planting between 50 – 100 oak acorns and 25 – 50 seedlings to test oak restoration techniques, with the hope of establishing at least 50 new oak seedlings from acorns and at least 25 seedlings from transplants.

OVERALL RESULT: We pleased to report that we completed all proposed activities as outlined in our proposal and achieved our anticipated outcomes.

EVALUATION:

Assessment of Coast Live Oak Woodlands. During the grant period, we completed a conditions assessment of an additional 60 acres of coast live oak woodlands on Starr Ranch; part of our long-term goal of assessing all 300 upland oak woodland acres on a five-year rotational basis. This conditions assessment tracks tree structure such as height, diameter, and health, including presence of tree pests and diseases, limb dieback or mortality. This work is critical as oak woodlands in Southern California are threatened by a variety of factors, including drought and climate variables as well as insect-fungal diseases. California is on record for its worst drought from December 2011 through March 2017 with the Southern California region currently drought-rated as D2-D4 (severe to exceptional). Prolonged periods of drought cause stress and dieback of oak trees. Drought-weakened trees are especially susceptible to invasive insects and other diseases. That's why having a handle on the conditions within the oak woodlands can help us with land management and restoration planning as well as early identification and response to infestations. Although we were pleased to see that the 60 acres assessed this year were found to be free of tree pests and diseases, we did find significant crown thinning within the oaks as well as new dieback and tree mortality. Some of the mortality we found came from heart rot, which is not uncommon in older oaks, but we also found more limb dieback which appeared to be drought-related. We are planning to survey another 60 acres this coming winter.

Bird Population and Distribution Data. We looked at conditions data for the upland oak woodlands and compared it with bird monitoring data to understand how woodland conditions are impacting wildlife – specifically the presence and distribution of songbirds. Our seasonal ornithologist did point count surveys (a quantitative sampling survey method that involves recording birds from a single point over a standardized time period) in the same 60 acres of woodlands that the interns took data on tree conditions. From this work, it appears that woodland bird populations remain stable, with Spotted Towhee, House Wren, Oak Titmouse, Acorn Woodpecker, and Anna's Hummingbird as our top five species found in the oak woodlands, as we had hoped to find. Woodland birds require healthy

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habitat for nesting and foraging.

Riparian Woodlands Monitoring. In addition to monitoring the upland oak woodlands, we also monitored 232 acres of riparian woodlands on Starr Ranch along the five-mile long Bell Creek for signs of tree pests and disease. Although tree pests and diseases can hit both upland and riparian woodlands, currently most of the infestation that is ravaging Southern California's woodlands moves through riparian corridors, attacking both sycamores and oaks. Two pests are causing the most damage in Southern California - the Goldspotted Oak Borer and the Polyphagous Shot Hole Borer. These have been observed from Ventura to San Diego County. The Goldspotted Oak Borer has been identified as the cause of mortality in over 25,000 trees in San Diego, Riverside, and Orange counties. Infestation has been observed in the Cleveland National Forest adjacent to Starr Ranch.

So far, neither of these pests have been seen on Starr Ranch. Over the winter and spring, the interns continued monitoring the riparian woodlands on a bi-weekly basis between November and May. Their work led to the discovery of signs of disease in some willow trees. We collected samples, but luckily a university pathologist and a California Department of Food and Agriculture pathologist determined that the pest was a native species, not one of the borer species. These consultants suggested we take no further action at this time. So far, we have been lucky. For a third year, our surveys have discovered no other signs of pests or diseases, despite the presence of affected trees in nearby county parks. We will start up this bi-weekly survey again this winter to stay on top of the woodland situation at Starr Ranch.

Oak Woodland Collecting, Storing, Transplanting and Monitoring. During the grant period, two of our seasonal interns completed a literature review on how best to collect, store, and plant acorns, and to transplant oak seedlings to enhance declining oak woodlands. They then completed a field study comparing different factors and their impact on germination and growth, such as placing the acorns within a protective cage and planting in sites with different available light levels to increase restoration outcomes.

For the study, they collected and planted 64 acorns into declining oak woodland habitat on Starr Ranch. Half of the acorns were covered with wire enclosures in attempt to prevent deer or other animals from eating the seedlings. The other half remained uncovered. Twenty oak seedlings were also collected and transplanted into an adjacent declining oak woodland habitat. These plots were then observed over a five-month period.

The study revealed that collecting and planting acorns was a quick and effective restoration method. Of the 64 acorns planted, 67% germinated and established healthy seedlings. There was no significant difference in growth between caged and control groups, as the cages were not able to keep caterpillar and other small insects away from the seedlings. However, insect damage did not seem to have a significant negative impact on the health of the acorn transplants. Seedlings from acorns also appeared to be more drought tolerant and required less irrigation water compared to transplanted seedlings. The plots containing acorns were not watered for a month and the seedlings were still growing new leaves. Interestingly, transplanting seedlings was found to be unfeasible. The method was time consuming and failed to establish healthy transplants. When collecting seedlings, it is extremely difficult to dig out the seedling in a way that does not damage the taproot. The shock from taproot damage and transplanting during a drought killed over a third of our transplants and the transplanted seedlings had virtually no new growth over a five-month period. As a result of this initial study, Starr Ranch will continue monitoring our test plots and will incorporate acorn planting into future coast live oak restoration projects.

Data Sharing. We shared our identification and transplanting protocols and monitoring data with other Southern California land managers, including with the SoCal Emerging Tree Pests Working Group and the Natural Resources/Urban Forestry Shot Hole Borer Coalition of Southern California. Starr Ranch's Research Director now participates on the SoCal Emerging Tree Pest Committee, a collaboration of wildland managers across the region, which meets every two weeks via conference call about plans to educate the public about ways to prevent spread of tree diseases. Additionally, we hosted one professional meeting at Starr Ranch to discuss our work and hear about updates from other efforts underway in Orange County. We also had our interns develop identification tools for staff and volunteers to use when out in the field. They presented this information during a lunchtime then gave a PowerPoint presentation on signs of tree pests.

Q10 Please describe any challenges/obstacles the organization encountered (if any) in attaining goals & objectives.

During the grant period, we encountered two significant challenges. First, and foremost is the ongoing drought. This past year was another severe drought year with several red flag warning days over what is typically our rainy season. Drought stresses our woodlands and makes them more susceptible to tree pests and diseases. Drought also increases the need for using irrigation to establish new restoration plantings, such as our oak woodland restoration projects. The second significant challenge came when our Research Director Sandy DeSimone was injured in a four-wheel drive accident on Starr Ranch in April. This meant she could not mentor our seasonal interns for a couple of months while she recovered. Thanks to the good work she put in earlier in the year, the interns understood their job responsibilities and did impressively well carrying on with their projects while our director recuperated.

Q11 How did you overcome and/or address the challenges and obstacles?

To support our oak transplant research project during the dry winter, we had to irrigate the new plantings, using irrigation water from our rain catchment tank that was previously installed with support from the S.L. Gimbel Fund. The Research Director was able to communicate by email with interns to answer questions and help keep them on track while she convalesced.

Q12 Describe any unintended positive outcomes as a result of the efforts supported by this grant.

Finding evidence of an infestation by a native tree pest gave us a good dry run through of our protocols from identifying, collecting samples, and working with university researchers. So far, we have been very lucky at Starr Ranch, and are glad to be better prepared to protect our woodlands.

Q13 Briefly describe the impact this grant has had on the organization and community served.

Tree pests and diseases, along with drought and repeated wildfire, pose serious threats to Southern California natural and community landscapes and to quality of life for the region's citizens. In addition to our work benefitting Starr Ranch and its natural resources, we were able to share our educational materials on tree pest and diseases with our two neighboring communities so that residents there are better able to identify early signs of tree infestations and support efforts to reduce the spread of these pests and diseases. We are currently planning to share our identification tools during a panel discussion about tree pests and diseases at the November Audubon General Conference. This event brings together leaders from all 49 local Audubon chapters from across the state. We are also communicating results of upland and riparian woodland monitoring to University of California Riverside researchers and to several state and regional working groups and agencies, which helps disseminate information and share best practices within the profession.

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Q14 Please provide a budget expenditure report of the approved line items. Include a brief narrative on how the funds were used to fulfill grant objectives.

All S.L. Gimbel funds were expended within the grant period and in accordance with the project budget. National Audubon Society/Audubon California passed through 100% of funds provided for the purposes of achieving the described project on Audubon Starr Ranch Sanctuary. S.L. Gimbel Foundation grant funds were allocated to these costs:

- \$9,500 – Salary for the Director of Research and Education Dr. Sandy DeSimone. 10 hours a week for 52 weeks at \$35/hour. Remaining costs were covered by Audubon California general operating funds (as shown in our proposed project budget as “agency funds”). Sandy oversees the work of the seasonal employees in monitoring, research and education and is a full-time, year-round employee of Audubon. She is also responsible for sharing research and monitoring findings with other land management agencies, such as through the SoCal Emerging Pests Committee.
- \$19,260 – Salary and payroll costs for two seasonal interns. 20 hours a week for 36 weeks at \$15/hour. These interns carried out the assessments and transplanting activities related to the project. A portion of the total costs were paid out of Audubon’s general operating funds.
- \$3,240 - Seasonal ornithologist. 6 hours a week, 36 weeks at \$15/hour. The seasonal ornithologist completed bird population surveys in the upper woodland areas and helped correlate data with the woodland health assessment information.
- \$3,600 – Benefits. This cost is to cover the benefits paid to full-time, year-round employees, estimated at 33% of salary costs. The remaining costs of benefits were covered by Audubon as were the costs of payroll taxes for the seasonal employees.

In addition to the costs identified in the narrative ahead, Audubon also covered overhead and occupancy costs including finance, legal, human resources, insurance, IT services, rent, utilities and telephone, which are estimated at 40% of total salaries. These costs were not included in our request of support to the S.L. Gimbel Fund. Total project costs were just under \$60,000. Thank you for helping to defray these overall costs.

Page 4: Success Stories

Q15 Please relate a success story:

Our seasonal internship program is designed to give recent college graduates their first professional experience in land management. One of the two riparian interns we hired was newer to ecological science than we anticipated, requiring a lot of mentoring as she began tackling these complex restoration and monitoring projects at the beginning of her internship. With support from the Research Director and the other interns, she was able to become more independent. She really dug into the literature and was able to gain enough confidence to develop the first set of techniques around oak woodland restoration. She designed a strong research project and produced useful results for future restoration efforts. At the end of her internship, she left us this note:

“Thank you for your wonderful mentorship this season. I have learned so much! Thank you for creating an environment that is so conducive to discovery and friendship. Thank you for creating a home for us. Your dedication in restoring and preserving Starr Ranch Sanctuary is truly inspiring. This place and the land will always hold a special part of my heart. I am so proud to have contributed to such an effective and meaningful organization.”

We wish her well as she goes on with her professional career and we look forward to bringing on our next cohort of interns in October as part of our work to support the next generation of environmental leaders.

Q16 Please relate a success story here:

RE DEMOGRAPHIC INFORMATION: Although the specific activities for this year's oak and riparian woodland work did not directly engage the community, Starr Ranch continues to run robust programs including adult and youth environmental education, community-based habitat restoration work days, and community science projects, Overall engagement was 2,000 people last year. Of these, about 482 students in grades 2-12 came for educational programming. We tracked that 80% of students were Caucasian, 10% Hispanic or Latino, 7% Asian or Pacific Islander, and 2% African American, and 1% multi-ethnic or other. About 300 people participated in habitat restoration work days and 330 in community science projects, such as our ongoing migratory bird banding project which just completed its 20th year. Many of our students and volunteers tell us that Starr Ranch's programs are unique; one of the few opportunities in Orange County for them to be outdoors and give back to the environment

Q17 Please relate a success story here:

Respondent skipped this question

Page 5: Organizational Information

Q18 Which category best describes the organization. Please choose only one.

Environmental

Q19 What is the organization's primary program area of interest?

Environment/Environmental

Q20 Percentage of clients served through grant in each ethnic group category. Total must equal 100%

Respondent skipped this question

Q21 Approximate percentage of clients served from grant funds in each age category.

Respondent skipped this question

Q22 Approximate percentage of clients served with disabilities from grant funds.

Respondent skipped this question

Q23 Approximate percentage of clients served in each economic group.

Respondent skipped this question

Q24 Approximate percentage of clients served from grant funds in each population category.

Respondent skipped this question